EVALUATE ERTS IMAGERY FOR MAPPING AND DETECTION OF CHANGES OF SNOWCOVER ON LAND AND ON GLACIERS

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Type I Progress Report
ERTS-1

a. Title: Evaluate ERTS imagery for mapping and detection of changes of snowcover on land and on glaciers.

ERTS-A Proposal No.: 342-7

b. GSFC ID No. of P.I.: IN 045

c. Statement and explanation of any problems that are impeding the progress of the investigation:

1. A standing order change request was submitted 7 November 1972 and resubmitted in mid-January. As of this date we have had no information about this important action.

2. A data request was submitted 16 January for essential data not supplied under our existing standing order. Nothing has been received as of this date. Attempts to obtain essential data from EROS, Sioux Falls, have also resulted in long delays.

3. Many images taken in October and November are too dark for analysis.

4. As described in my letters to NASA-GSFC on 1 November, 13 December, and 14 December, distribution of data to me has been spotty and incomplete, especially for cycle I. The problem persists with little change.

d. Discussion of the accomplishments during the reporting period and those planned for the next reporting period:

Additional data on area of snowcover were obtained from ERTS images using the SRI ESIAC and by planimetering photographic enlargements. Enlargements of U-2 images were also measured, and U-2 data were transferred to enlarged ERTS images for comparison. Average snowline altitudes were measured over about 800 5-km squares of 27 September images in the Anchorage area and the results contoured. The concept of an equivalent snowline altitude (ESA) was developed and many examples calculated. A hydrologic analysis was made of the changing snowcover of the Thunder Creek drainage basin. A paper was prepared for the March 5-9 ERTS-1 Symposium.

Attention next period will be directed to calibration of ESIAC procedures for locating the snow/no-snow boundary, additional area measurements, and further study of the 27 September snowlines in Alaska.

e. Discussion of significant scientific results and their relationship to practical applications or operational problems including estimates of the cost benefits of any significant results.

The percentage of snowcover area on specific drainage basins was measured from ERTS imagery by video density slicing with a repeatability of 4 percent of the snowcovered area. Data from ERTS images of the melt season snowcover in the Thunder Creek drainage basin in the North Cascades were combined with existing hydrologic and meteorologic observations to enable calculations of the time distribution of the water stored in this mountain snowpack. Similar data could be used for frequent updating of expected inflow to reservoirs. Equivalent snowline altitudes were determined from area measurements. Snowline altitudes were also determined by combining enlarged ERTS images with maps. ERTS imagery was also successfully used to measure glacier accumulation area ratios for a small test basin.

f. A listing of published articles, and/or papers, pre-prints, in-house reports, abstracts of talks, that were released during the reporting period:

Abstract for ERTS-1 Symposium, "Evaluation of ERTS imagery for mapping and detection of changes of snowcover on land and on glaciers."

g. Recommendation concerning practical changes in operations, additional investigative effort, correlation of effort and/or results as related to a maximum utilization of the ERTS system:

Need additional U-2 overflights and ERTS imagery during summer of 1973 in order to have a useful time sequence.

h. A listing by date of any changes in Standing Order Forms:

7 November 1972, but no notice of action yet received.

i. ERTS Image Descriptor forms:

In preparation.

j. Listing by date of any changed Data Request forms submitted to Goddard Space Flight Center/NDPF during the reporting period:

16 January 1973
23 February 1973

k. Status of Data Collection Platforms:

N/A